To vape or not to vape…
and…
Complications of chronic THC use

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Faculty/Presenter Disclosure

- **Faculty:** Erin Knight

- **Relationships with commercial interests:**
  - Not Applicable

Mitigating Potential Bias

- Not applicable

Objectives

① Review current evidence-base for smoking cessation including discussion of vaping/e-cigarettes

② Provide a brief overview of chronic cannabis use, including cannabis use disorder and medical use of cannabis

③ Discuss effects of chronic cannabis use and review relevant information to discuss with patients, including harm reduction strategies (and vaping)

To vape or not to vape?

1) Review current evidence-base for smoking cessation

- Non-pharmacologic treatment

Physician advice for smoking cessation (Review)

Stead LF, Buitrago D, Preciado N, Sanchez G, Hartmann-Boyce J, Lancaster T

Increased likelihood of quit at 6 months (vs. placebo)
RR = 1.66

Small increased benefit from intensive advice vs. brief advice
RR = 1.37

1) Review current evidence-base for smoking cessation

- Non-pharmacologic treatment

Increased likelihood of quit at 6m (vs. BI) without pharmacotherapy RR = 1.57

Increased likelihood of quit at 6m (vs. BI) with pharmacotherapy RR = 1.24

Larger effect from intensive vs. brief counseling RR = 1.29

Individual behavioural counselling for smoking cessation (Review)

Lancaster T, Stead LF

1) Review current evidence-base for smoking cessation

- Non-pharmacologic treatment

Cochrane Library

Cochrane Database of Systematic Reviews

Increased cessation (vs. self-help)
RR = 1.88

Increased cessation (vs. BI)
RR = 1.22

Increased cessation (vs. no intervention)
RR = 2.60

Group behaviour therapy programmes for smoking cessation (Review)

Stead LF, Carroll AJ, Lancaster T

1) Review current evidence-base for smoking cessation

- Pharmacologic treatment

Nicotine replacement therapy for smoking cessation (Review)

Stead LF, Perera R, Bullen C, Mant D, Hartmann-Boyce J, Cahill K, Lancaster T

THE COCHRANE COLLABORATION®

All NRT forms vs. placebo
RR abstinence = 1.60

Combined > single NRT
RR = 1.34

NRT + bupropion > bupropion
RR = 1.24

1) Review current evidence-base for smoking cessation

- Pharmacologic treatment

Cochrane Library

Cochrane Database of Systematic Reviews

Bupropion vs. placebo
RR abstinence = 1.62

Nortriptyline vs. placebo
RR = 2.03

Bupropion = nortriptyline = NRT

Bupropion < varenicline
RR = 0.68

Antidepressants for smoking cessation (Review)

Hughes JR, Stead LF, Hartmann-Boyce J, Cahill K, Lancaster T

1) Review current evidence-base for smoking cessation

- Pharmacologic treatment

Varenicline vs. placebo
RR = 2.24

Lower dose varenicline
RR = 2.08

Varenicline vs. bupropion
RR = 1.39

Varenicline vs. NRT
RR = 1.25

Cochrane Library

Cochrane Database of Systematic Reviews

Nicotine receptor partial agonists for smoking cessation (Review)

Cahill K, Lindson-Hawley N, Thomas KH, Fanshawe TR, Lancaster T

1) Review current evidence-base for smoking cessation

- Pharmacologic treatment

Pharmacological interventions for smoking cessation: an overview and network meta-analysis (Review)

Cahill K, Stevens S, Perera R, Lancaster T

THE COCHRANE COLLABORATION®

NRT > placebo
OR = 1.84

Bupropion > placebo
OR = 1.82

Varenicline > placebo
OR = 2.88

Single NRT = bupropion

Combo NRT > single NRT

Varenicline > single NRT

Varenicline = combo NRT

1) Review current evidence-base for smoking cessation

- Pharmacologic treatment

Neuropsychiatric safety and efficacy of varenicline, bupropion, and nicotine patch in smokers with and without psychiatric disorders (EAGLES): a double-blind, randomised, placebo-controlled clinical trial

Robert M Anthenelli, Neal L Benowitz, Robert West, Lisa St Aubin, Thomas McRae, David Lawrence, John Ascher, Cristina Russ, Alok Krishen, A Eden Evins

  - Varenicline > NRT, bupropion > placebo
  - No significant increase in neuropsychiatric events re: varenicline, bupropion vs. NRT, placebo


Sports Illustrated
Zoom In
WHY QUIT?
blu™ electronic cigarettes...
"freedom to have a cigarette without the guilt."
— Jenny McCarthy
Click Here To Watch The Video
PREMIUM ELECTRONIC CIGARETTE
18+ only.
CALIFORNIA PROPOSITION 65 - Warning: This product contains nicotine, a chemical known to the state of California to cause birth defects or other reproductive harm.

1) …what about vaping/e-cigarettes?

- Efficacy for smoking cessation

E-cigarettes vs. non-nicotine E-cig
Increased smoking cessation

Low quality evidence from two RCTs

Unclear whether E-cig >=< NRT

Electronic cigarettes for smoking cessation (Review)

Hartmann-Boyce J, McRobbie H, Bullen C, Begh R, Stead LF, Hajek P

1) …what about vaping/e-cigarettes?

- Efficacy for smoking cessation
  - Overall mixed reviews, low quality evidence
  - Several cohort studies suggesting vaping/e-cigarettes associated with LOWER quit rates

1) …what about vaping/e-cigarettes?

- Role for harm reduction?
- Or further harm?
  - Largely unregulated devices
  - Inhalation of aerosols and toxic aldehydes
    - Bronchiolitis obliterans (“popcorn lung”)
  - Decreased perceived risk
    - Earlier onset use, increased frequency & quantity of use, decreased motivation to reduce use or quit
  - Reversing “de-normalization” of smoking
  - Increased use among youth, leading to increased smoking
  - Increased serious childhood poisonings (2010-2014)

Increasing Use in Youth

This rate tripled again from 2013 to 2014 (4.5% to 13.4%) with past-month use of e-cigarette

Nat'l Youth Tobacco survey (CDC)

1) Review current evidence-base for smoking cessation including discussion of vaping/e-cigarettes

- Take home points:
  - Talk to your patients about smoking cessation
  - Offer counseling for smoking cessation
  - Offer pharmacotherapy for smoking cessation
    - Varenicline and combined NRT (patch + short acting) are most effective
    - single NRT and bupropion also effective
  - Currently no evidence to suggest vaping/e-cigarettes for smoking cessation
    - Potential benefit for respiratory harm reduction BUT
      - Further studies required re: long term effects of aerosols
      - Increased regulation and quality control of devices needed
      - Discuss safe storing of e-liquids re: childhood poisonings
  - Caution around normalizing vaping/e-cigarette behaviour, particularly for youth

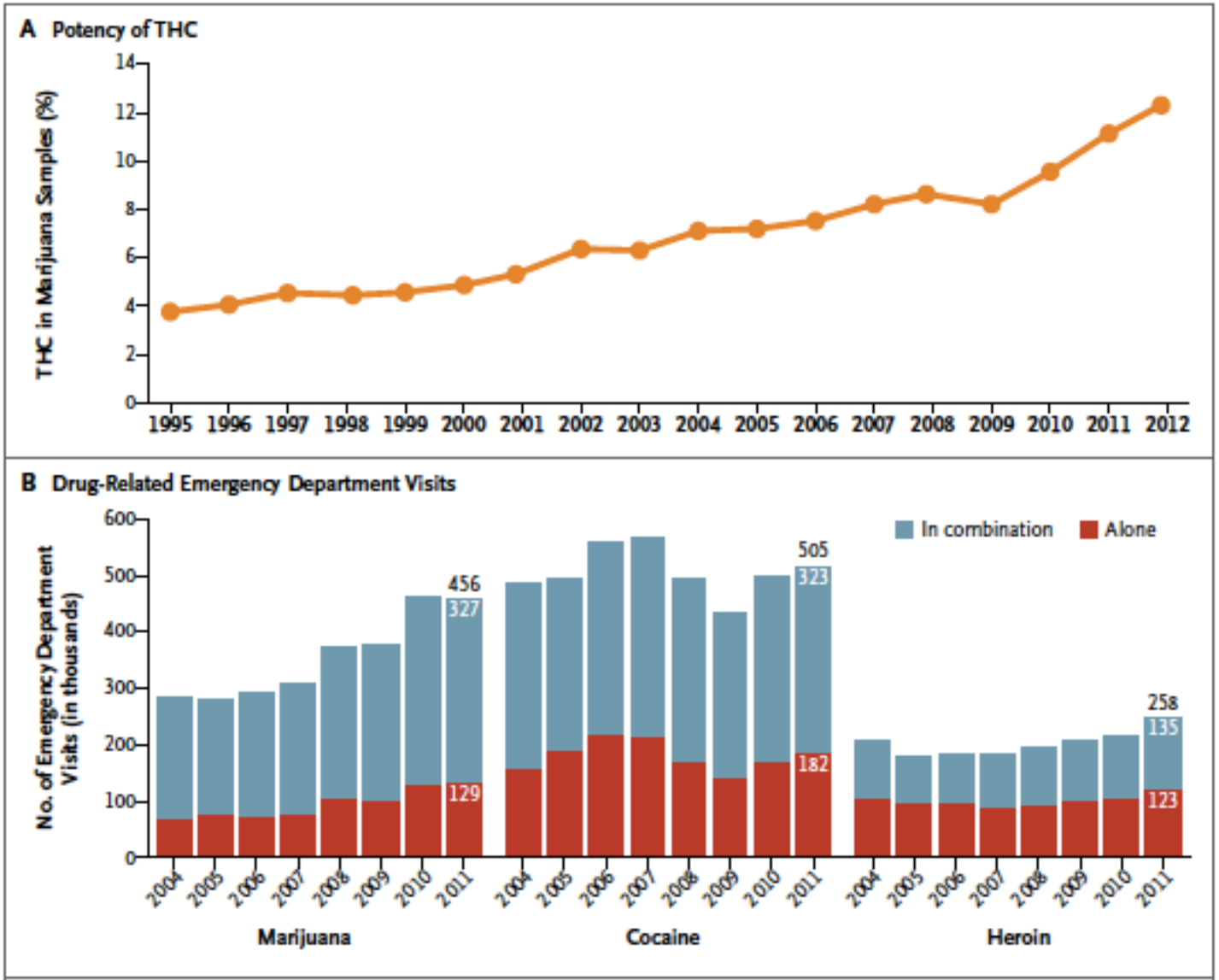
Questions?

Complications of chronic THC use

2) Overview of cannabis use, including CUD and medical cannabis

- Cannabis
  - Most commonly used illicit drug in Canada
    - 43% lifetime use
  - In Canada, past year cannabis use:
    - 10-15% of general population adults
    - 25-30% of adolescents and young adults
  - Illegal in Canada since 1923
  - Medicinal cannabis legal since 2001
  - Pending legalization…

2) Overview of cannabis use, including CUD and medical cannabis



2) Overview of cannabis use, including CUD and medical cannabis

Cannabis use disorder

- A problematic pattern of cannabis use leading to clinically significant impairment or distress, as manifested by at least 2 of the following, occurring within a 12-month period:

Compulsive use
- Cannabis is often taken in larger amounts or over a longer period than was intended.
- There is a persistent desire or unsuccessful efforts to cut down or control cannabis use.
- A great deal of time is spent in activities necessary to obtain cannabis, use cannabis, or recover from its effects.
- Craving, or a strong desire or urge to use cannabis.

Social impact
- Recurrent cannabis use resulting in a failure to fulfill major role obligations at work, school, or home.
- Continued cannabis use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of cannabis.
- Important social, occupational, or recreational activities are given up or reduced because of cannabis use.

Medical impact
- Recurrent cannabis use in situations in which it is physically hazardous.
- Cannabis use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by cannabis.

Physiologic effects
- Tolerance, as defined by either a (1) need for markedly increased cannabis to achieve intoxication or desired effect or (2) markedly diminished effect with continued use of the same amount of the substance.
- Withdrawal, as manifested by either (1) the characteristic withdrawal syndrome for cannabis or (2) cannabis is taken to relieve or avoid withdrawal symptoms

2) Overview of cannabis use, including CUD and medical cannabis

- Other cannabis related disorders (per DSM-V)
  - Cannabis intoxication
  - Cannabis withdrawal
  - Cannabis intoxication delirium
  - Cannabis induced psychotic disorder
  - Cannabis induced anxiety disorder
  - Cannabis induced sleep disorder
  - Unspecified cannabis-related disorder

2) Overview of cannabis use, including CUD and medical cannabis

Original Investigation

Cannabinoids for Medical Use

A Systematic Review and Meta-analysis

Penny F. Whiting, PhD; Robert F. Wolff, MD; Sohan Deshpande, MSc; Marcello Di Nisio, PhD; Steven Duffy, PgD; Adrian V. Hernandez, MD, PhD; J. Christiaan Keurentjes, MD, PhD; Shona Lang, PhD; Kate Misso, MSc; Steve Ryder, MSc; Simone Schmidlkofer, MSc; Marie Westwood, PhD; Jos Kleijnen, MD, PhD

CONCLUSIONS AND RELEVANCE There was moderate-quality evidence to support the use of cannabinoids for the treatment of chronic pain and spasticity. There was low-quality evidence suggesting that cannabinoids were associated with improvements in nausea and vomiting due to chemotherapy, weight gain in HIV infection, sleep disorders, and Tourette syndrome. Cannabinoids were associated with an increased risk of short-term AEs.

Sample Medical Document for the *Marihuana for Medical Purposes Regulations*

This document may be completed by the applicant's authorized health care practitioner as defined in the *Marihuana for Medical Purposes Regulations. An authorized health care practitioner includes physicians in all provinces and territories, and nurse practitioners in provinces and territories where prescribing dried marihuana for medical purposes is permitted under their scope of practice. If another document is used, it must contain all of the information below.*

Patient's Given Name and Surname _____

Patient's Date of Birth (DD/MM/YYYY) _____

Daily quantity of dried marihuana to be used by the patient: _____ g/day

Consider specifying % THC (maximum) ± % CBD (minimum)

The period of use is ____day(s) _____week(s) _____month(s).

NOTE: The period of use cannot exceed one year

Health care practitioner's given name and surname: _____

Profession: _____

Health care practitioner's business address: _____

_____

Full business address of the location at which the patient consulted the health care practitioner (if different than above): _____

_____

Phone Number: _____

Fax Number (if applicable): _____

Email Address (if applicable): _____

Province(s) Authorized to Practice in: _____

Health Care Practitioner's Licence number: _____

By signing this document, the health care practitioner is attesting that the information contained in this document is correct and complete.

Health Care Practitioner's Signature: _____

Date Signed (DD/MM/YYYY): _____

Recommendations from CFPC re: dried cannabis

1. No evidence for use in common pain conditions such as fibromyalgia or LBP. Consider only for refractory neuropathic pain.
2. Consider first adequate trials of other pharmacologic and non-pharmacologic strategies AND adequate trial of pharmaceutical cannabinoids (nabilone, dronabinol)
3. NOT APPROPRIATE for anxiety or insomnia
4. NOT APPROPRIATE if < 25, personal or family history of psychosis, current or past cannabis use disorder, CVD, resp disease, pregnant/breastfeeding
5. USE WITH CAUTION if active mood or anxiety disorder, smoker, risk factors for CVD, heavy EtOH/opioid/benzo use

Recommendations from CFPC re: dried cannabis

8. Before authorizing use, conduct a pain assessment, screen for anxiety and mood disorders, screen/assess for SUDs
9. Continually reassess; discontinue if not helpful or causing harm
10. Advise not to drive for 4h after inhalation, 6h after oral ingestion, 8h after any euphoria
14. Given weak evidence and know risks, when authorizing use, “Start low, go slow”
15. Include percentage THC on medical document when applying for MMPR

3) Effects of chronic cannabis use…

- Acute cognitive and psychomotor impairment
  - Motor vehicle collisions
- Effects on brain development
- Dependence, including other substances
- Psychosis
- Depression & anxiety
- Respiratory problems
- Cardiovascular and cerebrovascular events
- Poorer pregnancy outcomes
- Withdrawal

3) Effects of chronic cannabis use…

Table 2. Level of Confidence in the Evidence for Adverse Effects of Marijuana on Health and Well-Being.

Effect	Overall Level of Confidence*
Addiction to marijuana and other substances	High
Abnormal brain development	Medium
Progression to use of other drugs	Medium
Schizophrenia	Medium
Depression or anxiety	Medium
Diminished lifetime achievement	High
Motor vehicle accidents	High
Symptoms of chronic bronchitis	High
Lung cancer	Low

3) …harm reduction strategies

RECOMMENDATIONS

Recommendation 1: The most effective way to avoid any risks of cannabis use is to abstain from use. Those who decide to use need to recognize that they incur risks of a variety of—acute and long-term—adverse health and social outcomes. These risks will vary in their likelihood and severity with user characteristics, use patterns, and product qualities, and so may not be the same from user to user or use episode to another. *[Evidence Grade: None required.]*

Recommendation 2: Early initiation of cannabis use (i.e., most clearly that which begins before age 16 years) is associated with multiple subsequent adverse health and social effects in young adult life. These effects are particularly pronounced in early-onset users who also engage in intensive and frequent use. This may be in part because frequent cannabis use affects the developing brain. Prevention messages should emphasize that, the later cannabis use is initiated, the lower the risks will be for adverse effects on the user's general health and welfare throughout later life. *[Evidence Grade: Substantial.]*

Recommendation 3: High THC-content products are generally associated with higher risks of various (acute and chronic) mental and behavioral problem outcomes. Users should know the nature and composition of the cannabis products that they use, and ideally use cannabis products with low THC content. Given the evidence of CBD's attenuating effects on some THC-related outcomes, it is advisable to use cannabis containing high CBD:THC ratios. *[Evidence Grade: Substantial.]*

Recommendation 4: Recent reviews on synthetic cannabinoids indicate markedly more acute and severe adverse health effects from the use of these products (including instances of death). The use of these products should be avoided. *[Evidence Grade: Limited.]*

Recommendation 5: Regular inhalation of combusted cannabis adversely affects respiratory health outcomes. While alternative delivery methods come with their own risks, it is generally preferable to avoid routes of administration that involve smoking combusted cannabis material (e.g., by using vaporizers or edibles). Use of edibles eliminates respiratory risks, but the delayed onset of psychoactive effect may result in the use of larger than intended doses and subsequently increased (mainly acute, e.g., from impairment) adverse effects. *[Evidence Grade: Substantial.]*

3) …harm reduction strategies

Recommendation 6: Users should avoid practices such as "deep inhalation," breath-holding, or the Valsalva maneuver to increase psychoactive ingredient absorption when smoking cannabis, as these practices disproportionately increase the intake of toxic material into the pulmonary system. *[Evidence Grade: Limited.]*

Recommendation 7: Frequent or intensive (e.g., daily or near-daily) cannabis use is strongly associated with higher risks of experiencing adverse health and social outcomes related to cannabis use. Users should be aware and vigilant to keep their own cannabis use—and that of friends, peers, or fellow users—occasional (e.g., use only on 1 day/week, weekend use only, etc.) at most. *[Evidence Grade: Substantial.]*

Recommendation 8: Driving while impaired from cannabis is associated with an increased risk of involvement in motor-vehicle accidents. It is recommended that users categorically refrain from driving (or operating other machinery or mobility devices) for at least 6 hours after using cannabis. This wait time may need to be longer, depending on the user and the properties of the specific cannabis product used. Besides these behavioral recommendations, users are bound by locally applicable legal limits concerning cannabis impairment and driving. The use of both cannabis and alcohol results in multiply increased impairment and risks for driving, and categorically should be avoided. *[Evidence Grade: Substantial.]*

Recommendation 9: There are some populations at probable higher risk for cannabis-related adverse effects who should refrain from using cannabis. These include individuals with predisposition for, or a first-degree family history of, psychosis and substance use disorders, as well as pregnant women (primarily to avoid adverse effects on the fetus or newborn). These recommendations, in part, are based on precautionary principles. *[Evidence Grade: Substantial.]*

Recommendation 10: While data are sparse, it is likely that the combination of some of the risk behaviors listed above will magnify the risk of adverse outcomes from cannabis use. For example, early-onset use involving frequent use of high-potency cannabis is likely to disproportionately increase the risks of experiencing acute or chronic problems. Preventing these combined high-risk patterns of use should be avoided by the user and a policy focus. *[Evidence Grade: Limited.]*

Note. A detailed rationale for each evidence grade is provided as a supplement to the online version of this article at http://www.ajph.org.

To vape or not to vape?

High School Students' Use of Electronic Cigarettes to Vaporize Cannabis

Meghan E. Morean, PhD[a,b], Grace Kong, PhD[b], Deepa R. Camenga, MD[c], Dana A. Cavallo, PhD[b], Suchitra Krishnan-Sarin, PhD[b]

abstract

BACKGROUND AND OBJECTIVES: Electronic cigarette (e-cigarette) use is increasing rapidly among high school (HS) students. Of concern, e-cigarettes can be used to vaporize cannabis, although use rates among adolescents are unknown. We evaluated lifetime rates of using e-cigarettes to vaporize cannabis among all lifetime e-cigarette users (27.9%), all lifetime cannabis users (29.2%), and lifetime users of both e-cigarettes and cannabis (18.8%); common means of vaporizing cannabis including hash oil, wax infused with Δ-9-tetrahydrocannabinol (THC), and dried cannabis; and demographic predictors of using e-cigarettes to vaporize cannabis.

METHODS: In the spring of 2014, 3847 Connecticut HS students completed an anonymous survey assessing e-cigarette and cannabis use.

ARTICLE IN PRESS

Toking, Vaping, and Eating for Health or Fun

Marijuana Use Patterns in Adults, U.S., 2014

Gillian L. Schauer, PhD, MPH,[1,2] Brian A. King, PhD, MPH,[3] Rebecca E. Bunnell, ScD, MEd,[3] Gabbi Promoff, MA,[3] Timothy A. McAfee, MD, MPH[3]

Review: The Pax Ploom, for the executive stoner

In **Entertainment** by **Ned Hepburn** / August 20, 2013

2) Provide a brief overview of chronic cannabis use, including cannabis use disorder and medical use of cannabis

3) Discuss effects of chronic cannabis use and review relevant information to discuss with patients, including harm reduction strategies (and vaping)

- Take home points:
  - Cannabis use is common and may become more so with pending legalization
  - Cannabis used chronically for recreational or medical purposes may produce adverse effects.
    - These are more profound with early onset/heavy use
  - Discussion about risks and benefits may lead to harm reduction for patients using cannabis
  - Despite increasing popularity of vaporizing devices, it remains unclear whether vaporizing cannabis should be recommended as a harm reduction tool

Questions?

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